DAQ & Electronics

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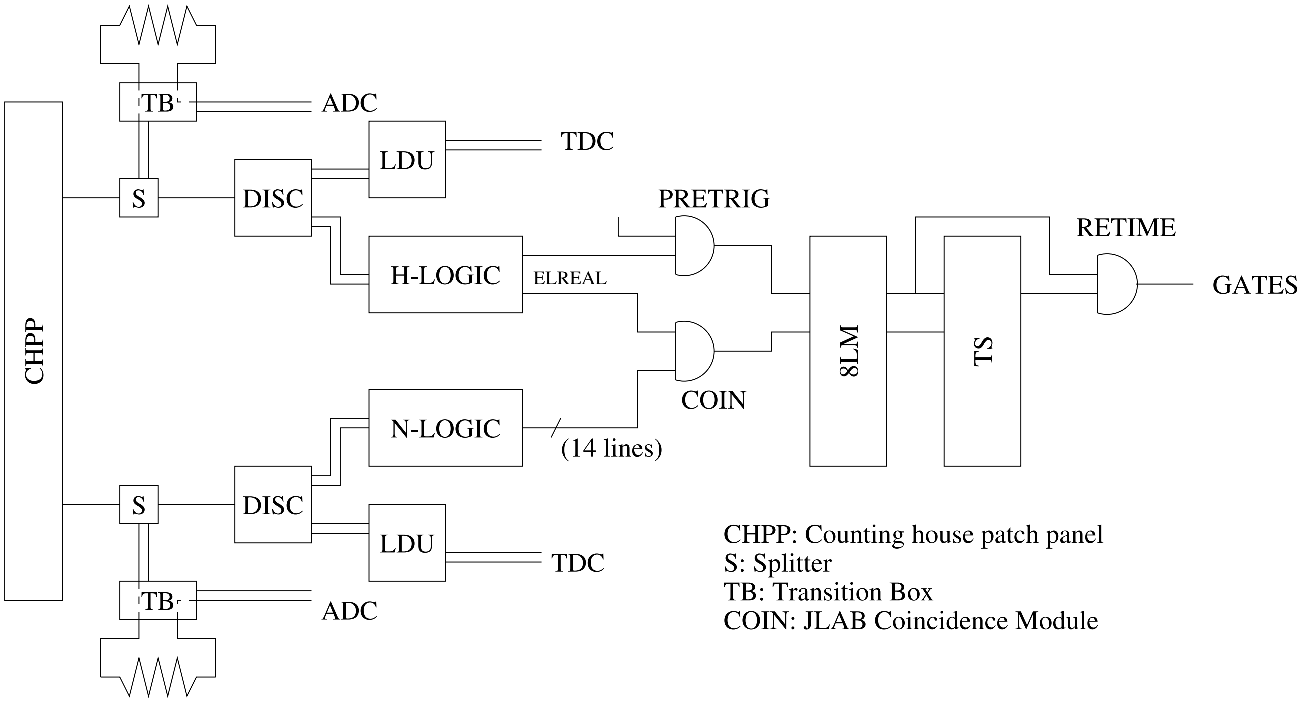
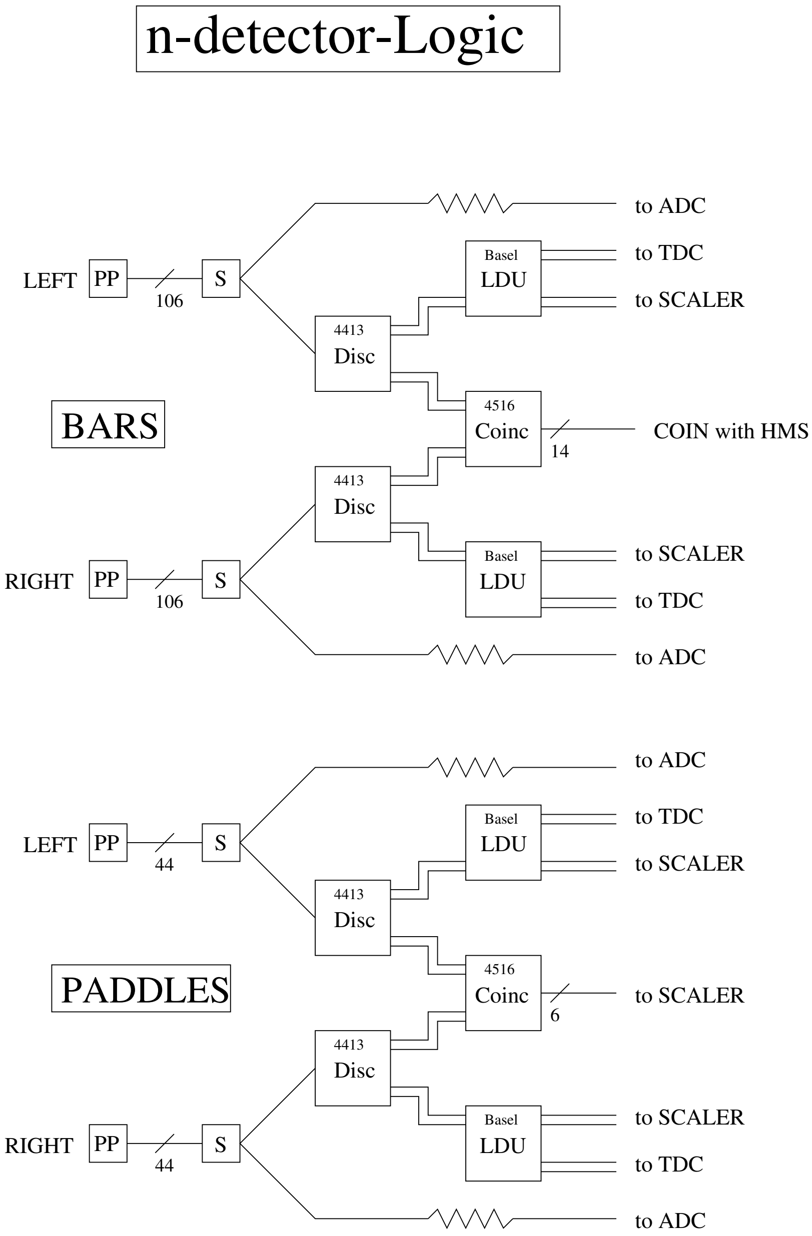
Systems

- Electronics: 98 setup with some improvements
  - Autonomous Third Arm
  - e$\star$B coincidence
- DAQ: Similar system as last experiment
  - Open Trigger
  - New trigger supervisor
  - Event by event scaler/ Oversampling
  - Scaler Server

Basic Electronics Scheme



NDET Electronics



Electronics Dead-time Control

- Gen98 used e$\star$B coincidence as main trigger
  - B (OR of all bars) showed large rates
  - Rate dependent electronics dead time induced (neglible impact on asymmetry)

- Gen01 will use “Open Trigger”
  read out neutron detector for each HMS event
  . . . (< 1kHz event rate for 100 nA)
  requires “Buffered Mode”‘ for DAQ
  . . . (12 % dead-time @ 1 kHz)

- Pulser System
  Measurement of electronics dead-time

- e$\star$B for diagnostics and as backup
  Coinc between subsets of bars and the HMS
  (JLAB coincidence module under construction)

Scaler Business

- Asynchronous Scalers (single rates ...)
  readout every two seconds
- 3 Helicity gated scalers (h^-, h^+, h^-&h^+)
- 1 Event by Event Scaler (Oversampling)
  read out for every event (Clock, BCM)
- New Trigger Supervisor: "External Event"
  $\Rightarrow$Scaler trigger can't get lost
  $\Rightarrow$Synchronization check every helicity change
- Scaler Server on Scaler CPUs
  requires Scalers free running without DAQ active
  $\Rightarrow$Rate checks during setup

Hardware Situation

- Gen98 used SOS electronics
- For GeN01: Autonomous Third Arm

Crates delivered

CPUs delivered

Modules
Commercial: delivered
Custom
- 15 Basel LDUs: delivered
- 2 JLAB COIN modules: ready by end of Mai
- JLAB Trigger Supervisor: ready by end of Mai

Cables
BNC Delay (390 ns): delivered
Lemo, BNC ($\geq$32ns): ???
Lemo, BNC ($<$ 32ns): delivered
Coax Ribbon: delivery time Mai 15

Task list and Milestones

- Tasklist divided into 3 periods
  - Preparation
  - Installation
  - Run
- Milestone
  - NDET on the floor (06/11)
    DAQ and Electronics ready for NDET tests
- Documentation:
  http://galileo.phys.virginia.edu/~mfz7a/E-93026/DAQ+El/

— PREPARATION —

[ ]: done [ ]: in progress

NDET hardware: Overview/ requests [zeier]

- Fastbus/ VME crates and ADC/TDC/Scalers **[wood]**
- NIM/CAMAC crates/modules **[garrow]**
- COIN module **[cuevas]**
- cables/connectors **[zeier]**

Design of NDET logic:

- simplified/improved 1998 version **[zeier/mitchell]**

Define scaler strategies:

- trigger/ gating/ oversampling/ readout **[zeier/wood/yun]**

Define trigger programming (8LM/TS):

- trigger logic, event types etc. **[zeier/mitchell]**

Define slow control logging needs for data stream (epics.dictionary) and epics logger ("Target logger")

- injector **[fenker]**
- hms **[Hampton U]**
- polarized target **[mckee]**
- NDET **[warren]**
- Beamline **[mitchell]**

Review epics/CODA links with Poltar **[mcnulty/wood]**

CODA:

- define run types **[zeier]**
- define begin of run information **[wesselmann]**
- define end of run information **[wesselmann]**
- define user events (HV etc.) **[tadevosjan]**

— SETUP —-

Basic DAQ Setup

- Setup DAQ directory tree and test functionality [wood]
- Setup CODA database entries (run types etc) **[wood]**

DAQ Readout Lists

- Write Fastbus and Scaler readout lists **[wood]**
- programming 8LM/TS **[wood]**

Slow Control

- Setup epics logging **[wood]**
- write scripts which are executed in coda **[wood]**
- HV maps **[yun]**

Setup NDET/trigger electronics:

[smith/piasetzki/garrow/jourdan/zeier]

- install 3rd arm cables/delays/TB/splitters
- setup NDET logic - setup trigger logic
- retiming, ADC and TDC gates

Scaler Tsar **[yun]**

- Scaler cabling/ gating/ maps
- maintain report files (templates)
- certify scaler gating/logic/readout/unpacking code
- Scaler Server [wood]

Helicity: **[fenker]**

- check logic and redundant recording

Pulser electronics (deadtime check) **[jourdan]**

TBPM/SEM electronics **[steinacher]**

— RUN —

maintain DAQ **[wood]**

maintain NDET/trigger electronics

[smith/piasetzki/garrow/jourdan/zeier]

maintain scaler stuff **[yun]**

maintain moller/helicity electronics **[fenker]**